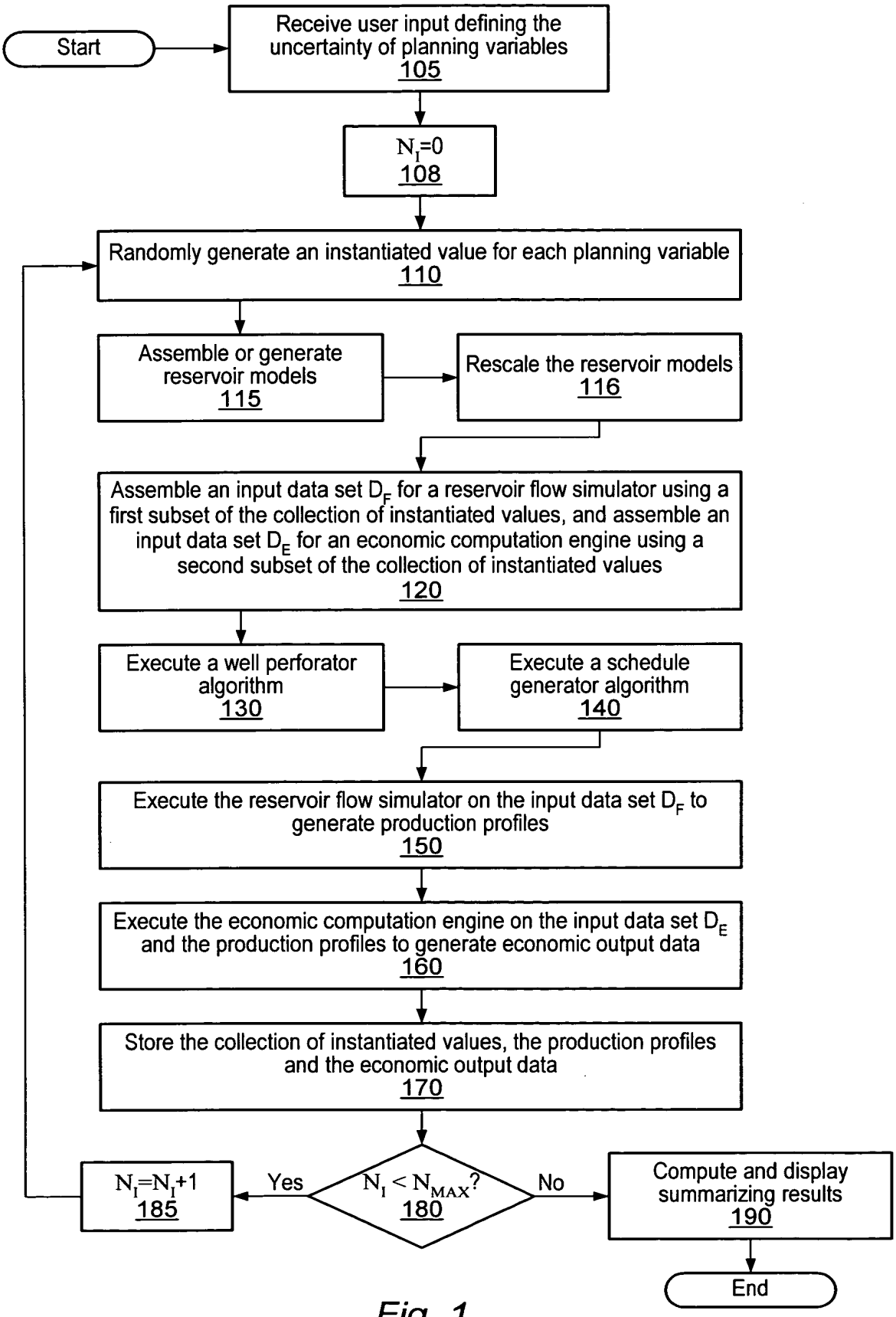
Start
Receive user input defining the uncertainty of planning variables
105
N_I=0
108
Randomly generate an instantiated value for each planning variable
110
Assemble or generate reservoir models
115
Rescale the reservoir models
116
Assemble an input data set D_F for a reservoir flow simulator using a first subset of the collection of instantiated values, and assemble an input data set D_E for an economic computation engine using a second subset of the collection of instantiated values
120
Execute a well perforator algorithm
130
Execute a schedule generator algorithm
140
Execute the reservoir flow simulator on the input data set D_F to generate production profiles
150
Execute the economic computation engine on the input data set D_E and the production profiles to generate economic output data
160
Store the collection of instantiated values, the production profiles and the economic output data
170
$N_I < N_{MAX}$?
180
Yes
N_I=N_I+1
185
No
Compute and display summarizing results
190
End

Fig. 1

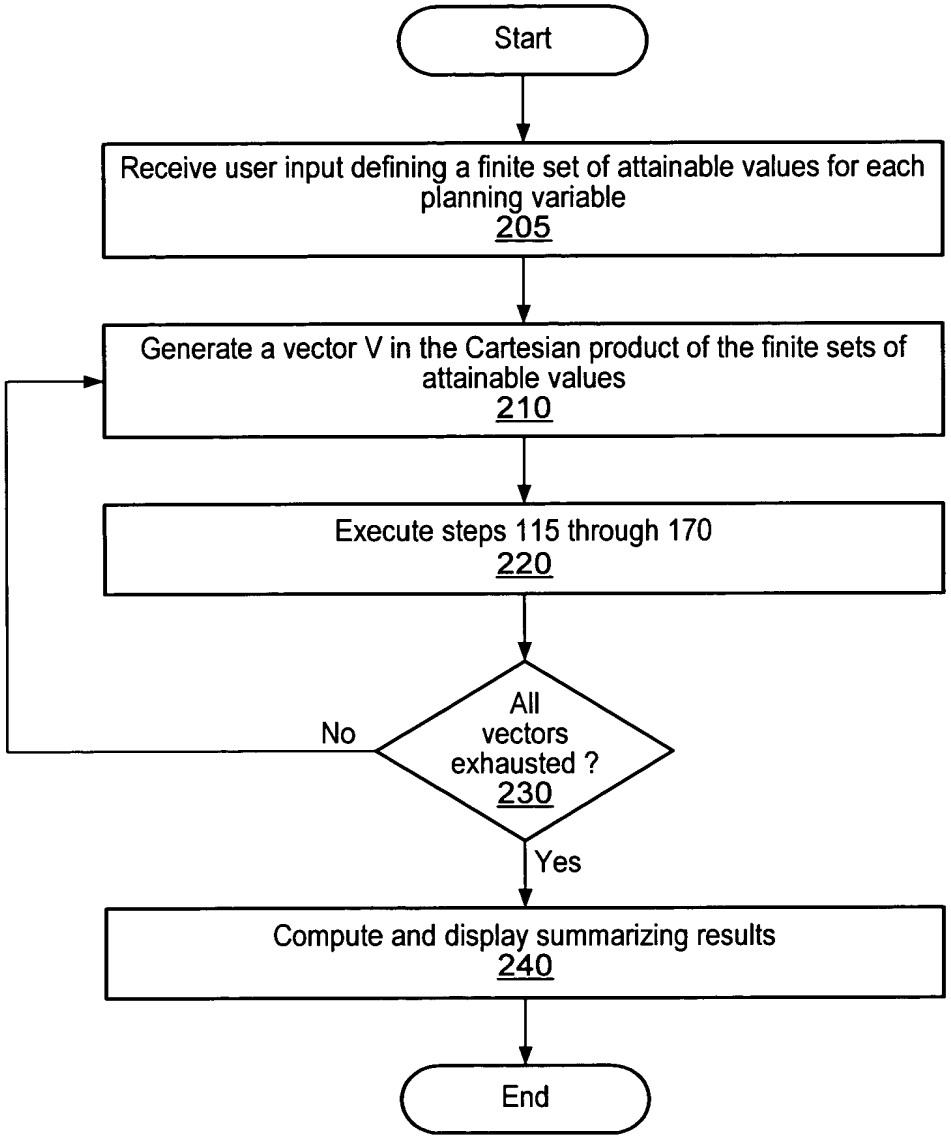
Start
Receive user input defining a finite set of attainable values for each planning variable
205
Generate a vector V in the Cartesian product of the finite sets of attainable values
210
Execute steps 115 through 170
220
All vectors exhausted ?
230
No
Yes
Compute and display summarizing results
240
End

Fig. 2

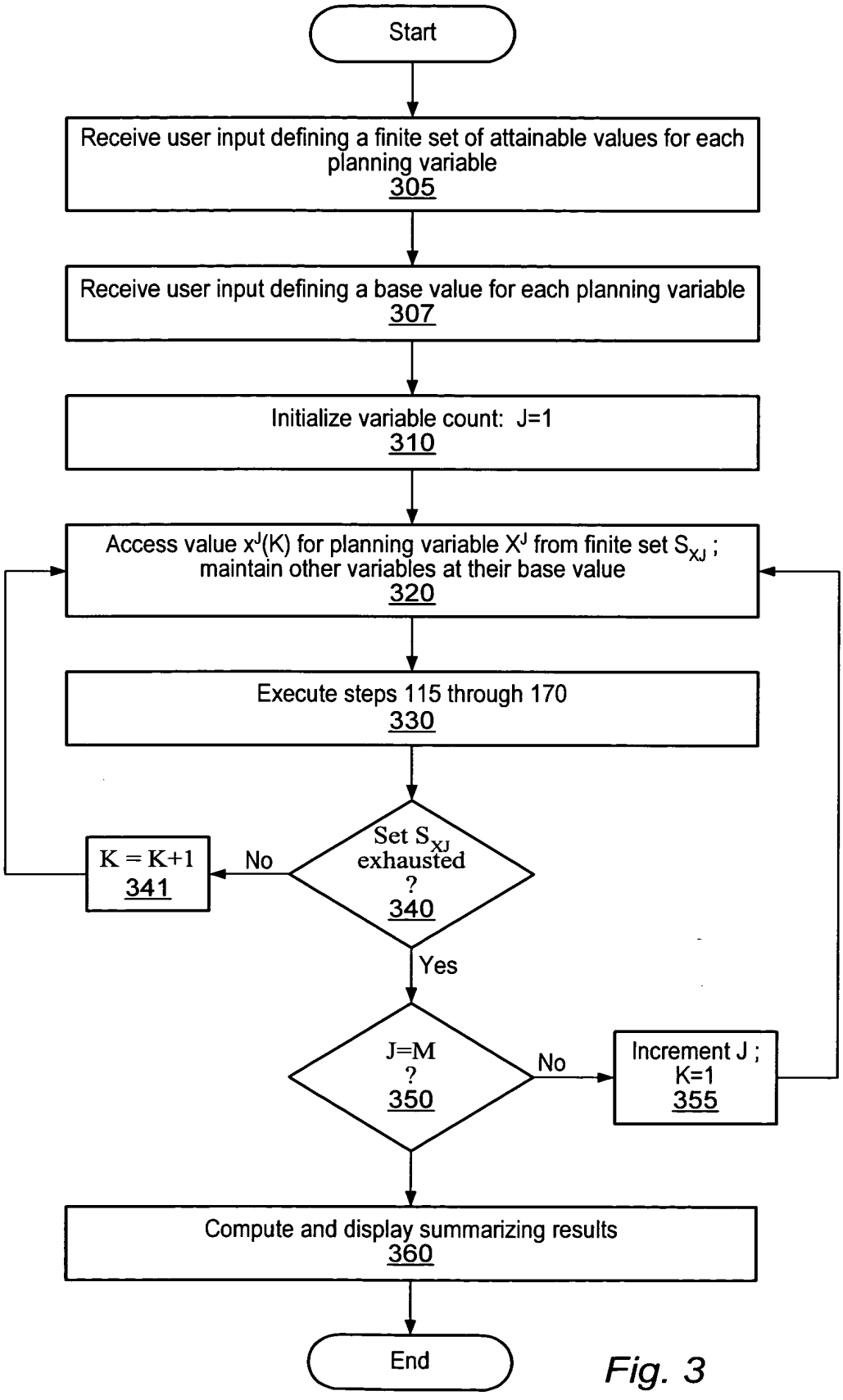
Start
Receive user input defining a finite set of attainable values for each planning variable
305
Receive user input defining a base value for each planning variable
307
Initialize variable count: J=1
310
Access value $x^J(K)$ for planning variable X^J from finite set S_{XJ} ; maintain other variables at their base value
320
Execute steps 115 through 170
330
Set S_{XJ} exhausted ?
340
No
K = K+1
341
Yes
J=M ?
350
No
Increment J ; K=1
355
Compute and display summarizing results
360
End

Fig. 3

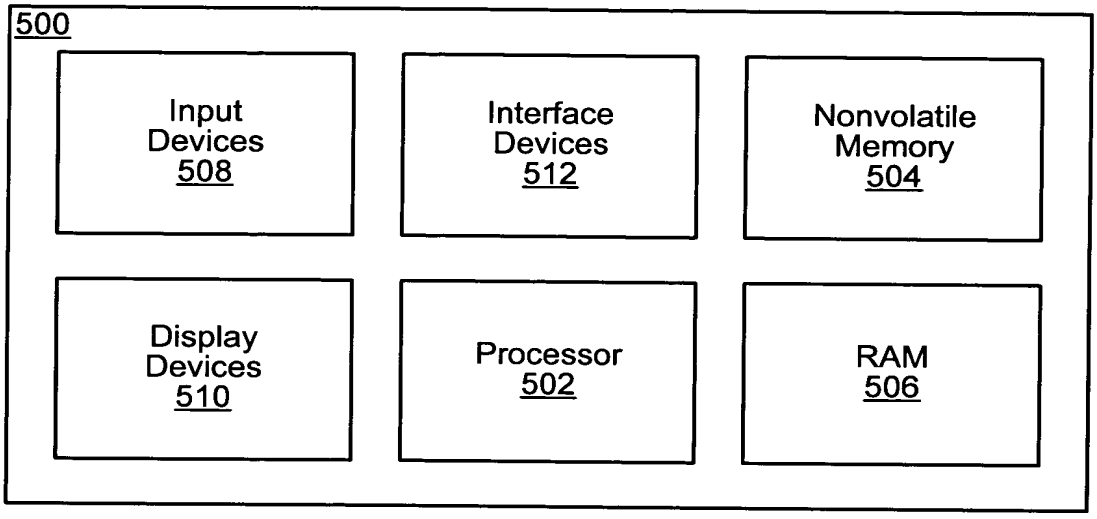
500
Input Devices 508
Interface Devices 512
Nonvolatile Memory 504
Display Devices 510
Processor 502
RAM 506

Fig. 4

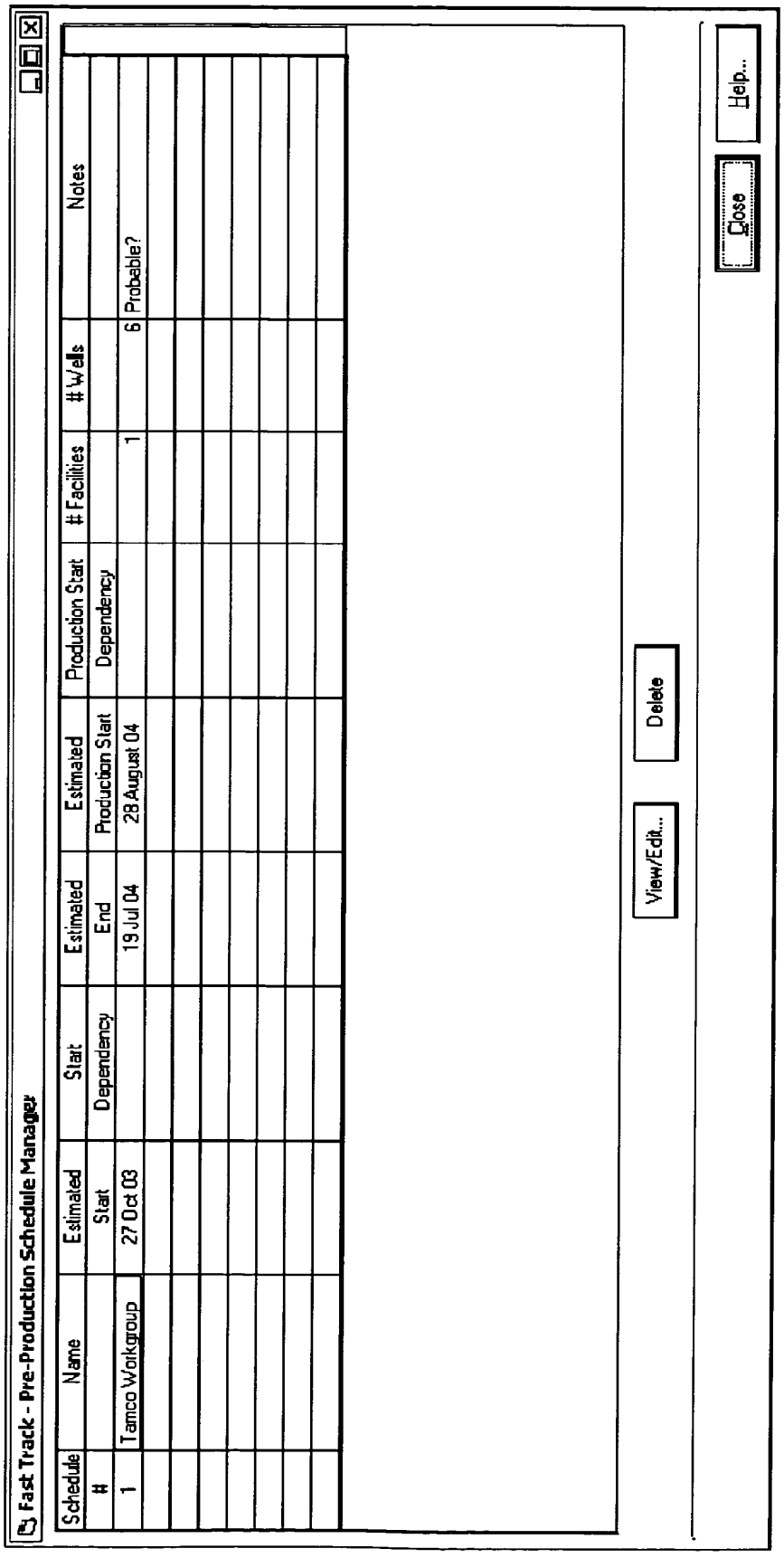
Fast Track - Pre-Production Schedule Manager
Schedule #
Name
Estimated Start
Start Dependency
Estimated End
Estimated Production Start
Production Start Dependency
Facilities
Wells
Notes
1
Tamco Workgroup
27 Oct 03
19 Jul 04
28 August 04
1
6
Probable?
View/Edit...
Delete
Close
Help...

Fig. 5

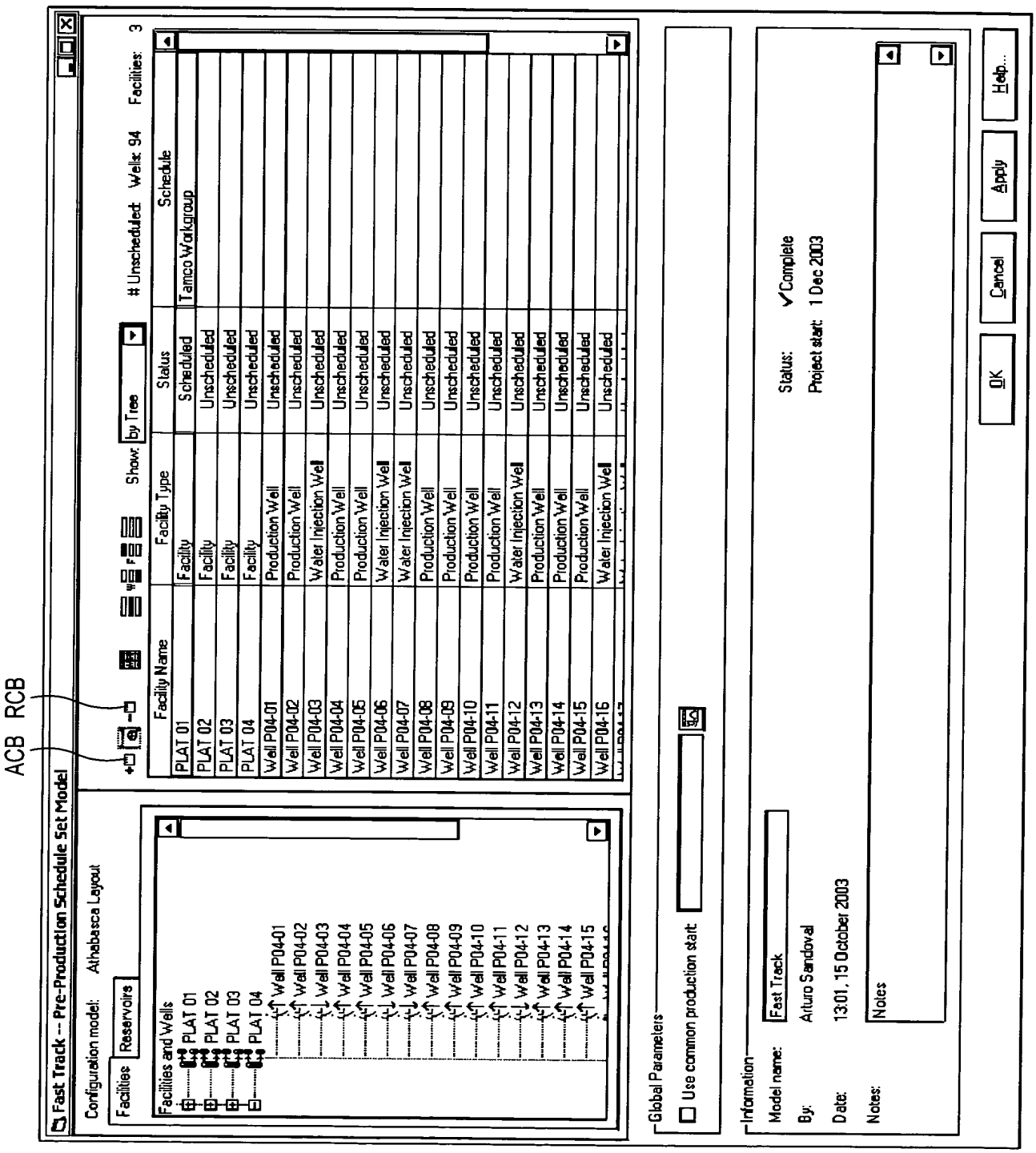
ACB
RCB
Fast Track -- Pre-Production Schedule Set Model
Configuration model: Athabasca Layout
Facilities
Reservoirs
Facilities and Wells
PLAT 01
PLAT 02
PLAT 03
PLAT 04
Well P04-01
Well P04-02
Well P04-03
Well P04-04
Well P04-05
Well P04-06
Well P04-07
Well P04-08
Well P04-09
Well P04-10
Well P04-11
Well P04-12
Well P04-13
Well P04-14
Well P04-15
Well P04-16
Show: by Tree
Unscheduled Wells: 94
Facilities: 3
Facility Name
Facility Type
Status
Schedule
Facility
Production Well
Water Injection Well
Scheduled
Unscheduled
Tamco Workgroup
Global Parameters
Use common production start:
Information
Model name: Fast Track
By: Arturo Sandoval
Date: 13:01, 15 October 2003
Notes:
Notes
Status: ✓Complete
Project start: 1 Dec 2003
OK
Cancel
Apply
Help...

Fig. 6

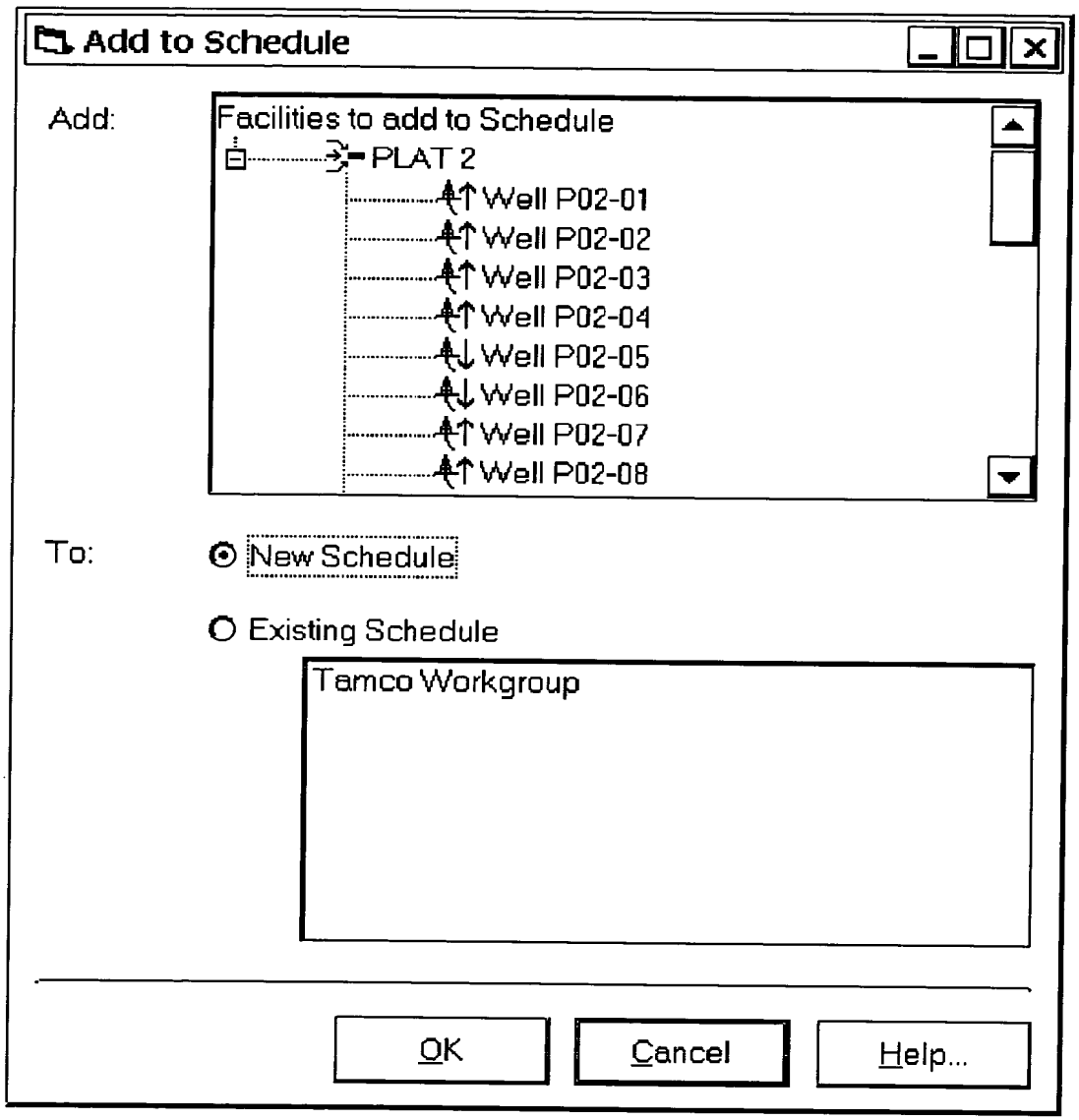
Add to Schedule
Add:
Facilities to add to Schedule
PLAT 2
Well P02-01
Well P02-02
Well P02-03
Well P02-04
Well P02-05
Well P02-06
Well P02-07
Well P02-08
To:
New Schedule
Existing Schedule
Tamco Workgroup
OK
Cancel
Help...

Fig. 7

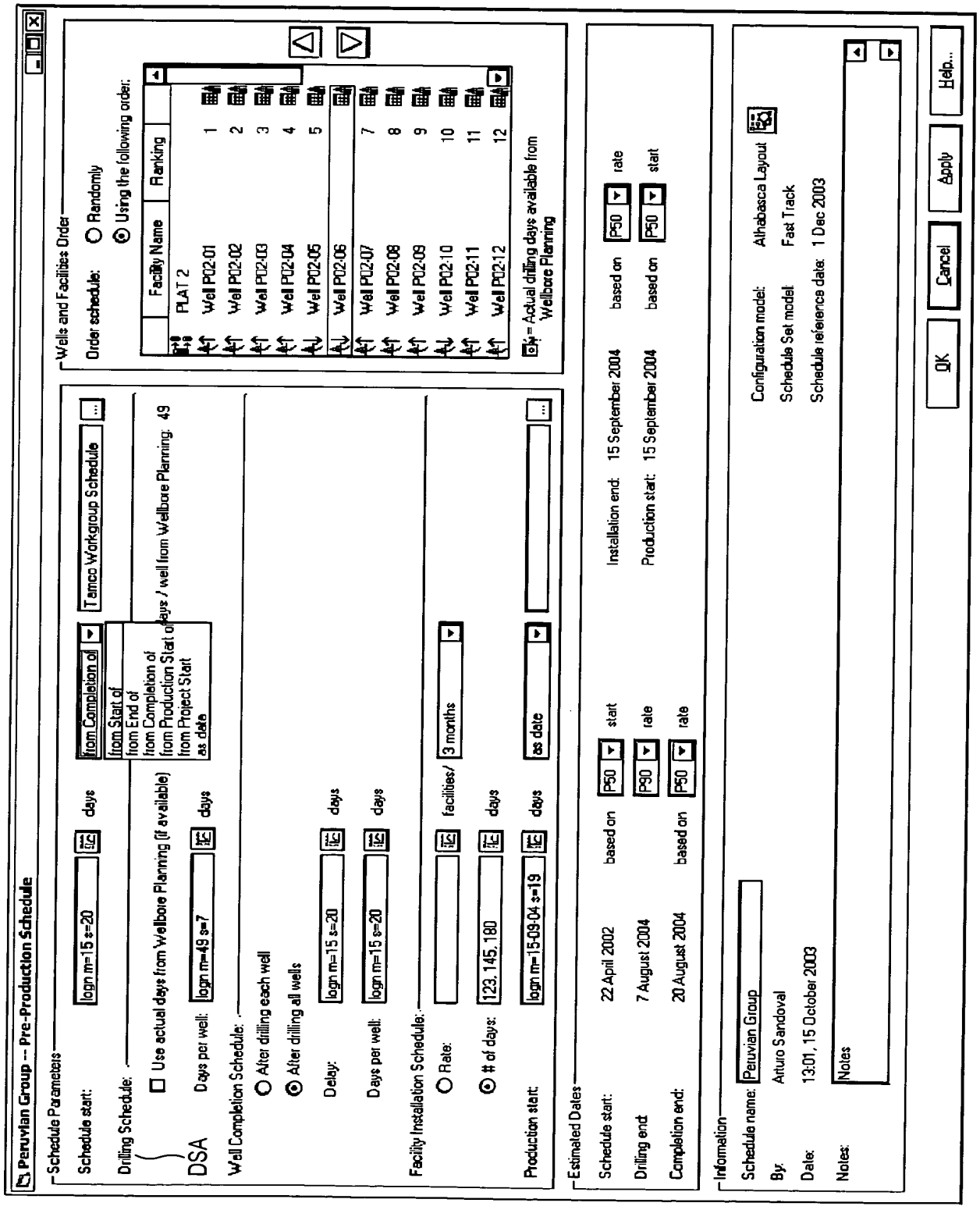
Peruvian Group -- Pre-Production Schedule
Schedule Parameters
Schedule start:
Drilling Schedule:
Use actual days from Wellbore Planning (if available)
DSA
Days per well:
Well Completion Schedule:
After drilling each well
After drilling all wells
Delay:
Days per well:
Facility Installation Schedule:
Rate:
# of days:
Production start:
from Completion of
from Start of
from End of
from Completion of
from Production Start of
from Project Start
as date
Tarraco Workgroup Schedule
days / well from Wellbore Planning: 49
facilities/
3 months
Wells and Facilities Order
Order schedule:
Randomly
Using the following order:
Facility Name
Ranking
PLAT 2
Well PG2-01
Well PG2-02
Well PG2-03
Well PG2-04
Well PG2-05
Well PG2-06
Well PG2-07
Well PG2-08
Well PG2-09
Well PG2-10
Well PG2-11
Well PG2-12
= Actual drilling days available from Wellbore Planning
Estimated Dates
Schedule start:
22 April 2002
based on
P50
start
Drilling end:
7 August 2004
P90
rate
Completion end:
20 August 2004
based on
P50
rate
Installation end:
15 September 2004
based on
P50
rate
Production start:
15 September 2004
based on
P50
start
Information
Schedule name:
Peruvian Group
By:
Arturo Sandoval
Date:
13:01, 15 October 2003
Notes:
Configuration model:
Athabasca Layout
Schedule Set model
Fast Track
Schedule reference date:
1 Dec 2003
OK
Cancel
Apply
Help...

Fig. 8

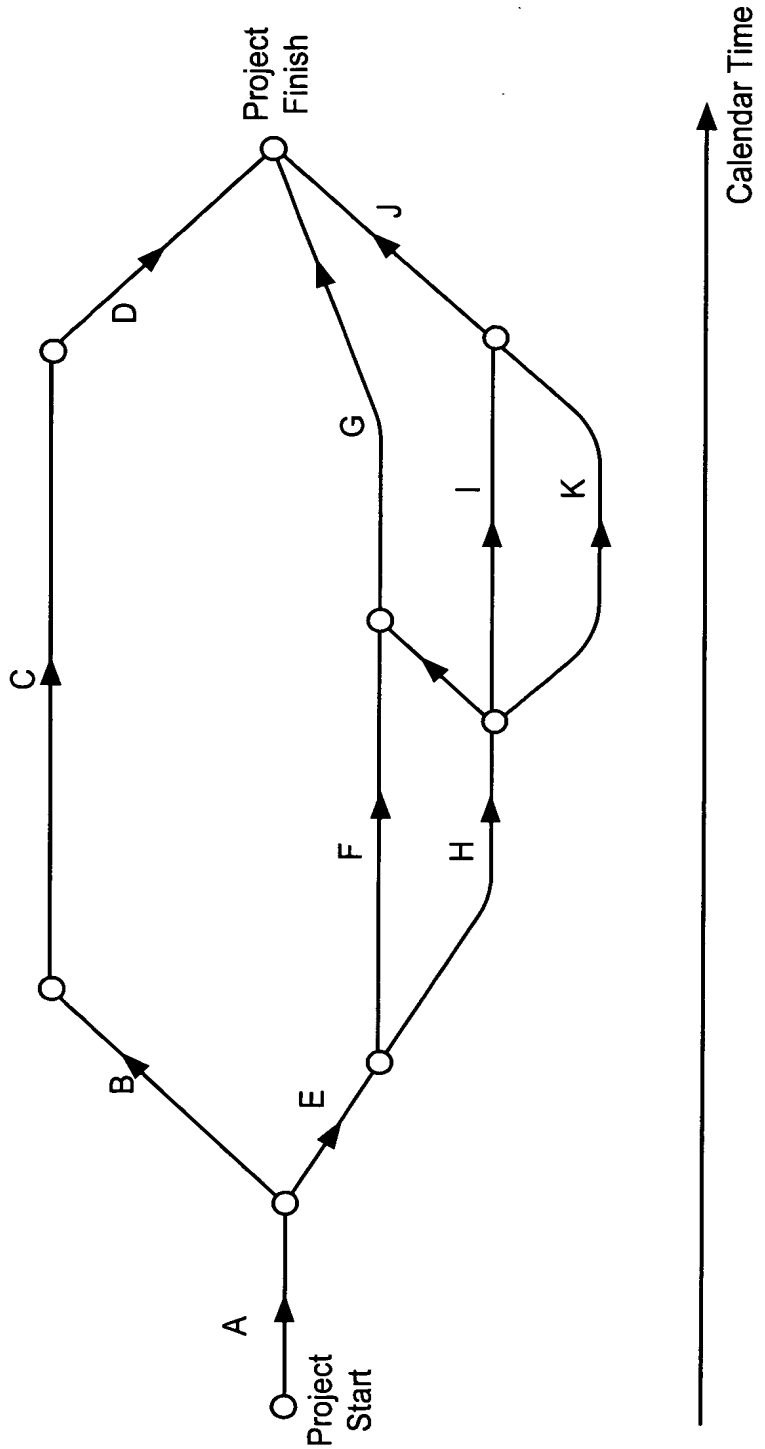

Fig. 9

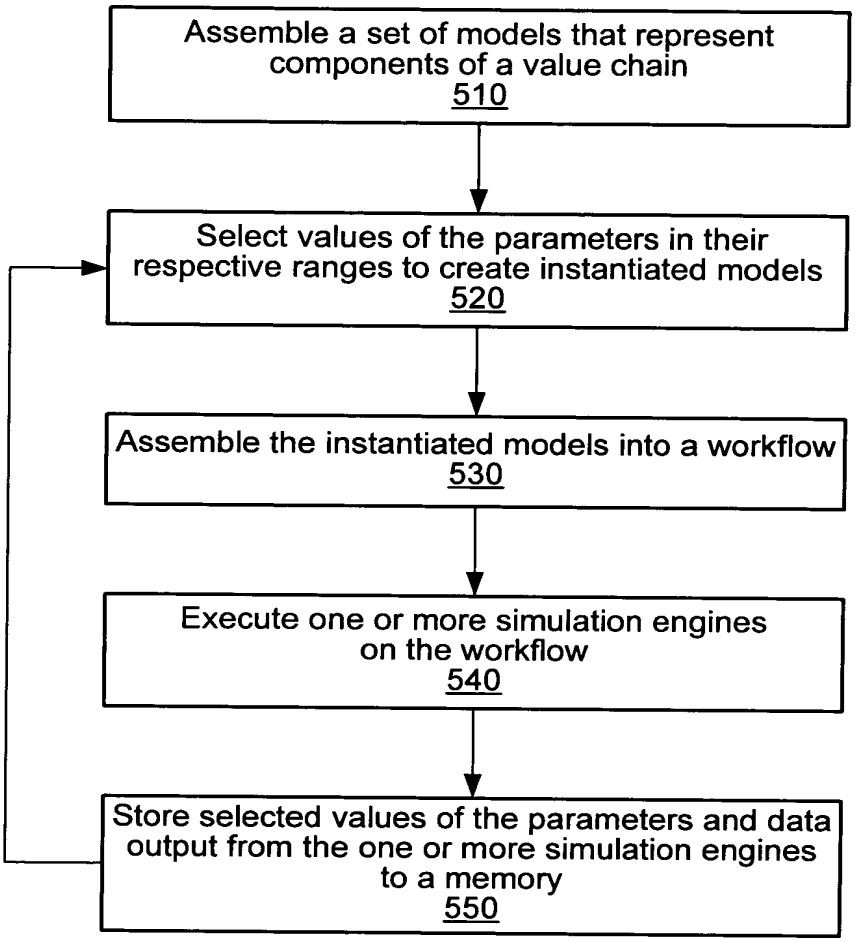
Assemble a set of models that represent components of a value chain
510
Select values of the parameters in their respective ranges to create instantiated models
520
Assemble the instantiated models into a workflow
530
Execute one or more simulation engines on the workflow
540
Store selected values of the parameters and data output from the one or more simulation engines to a memory
550

Fig. 10

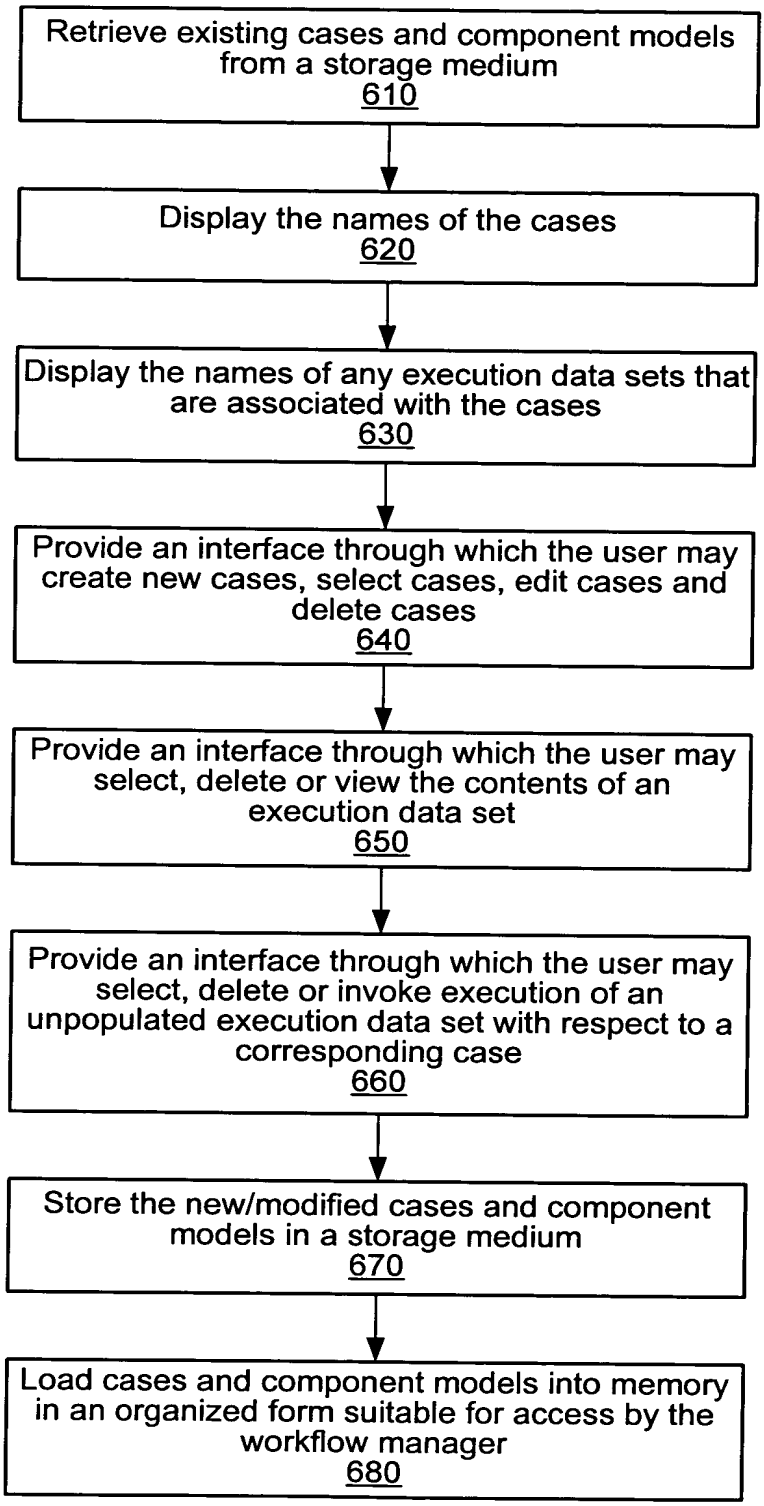
Retrieve existing cases and component models from a storage medium
610
Display the names of the cases
620
Display the names of any execution data sets that are associated with the cases
630
Provide an interface through which the user may create new cases, select cases, edit cases and delete cases
640
Provide an interface through which the user may select, delete or view the contents of an execution data set
650
Provide an interface through which the user may select, delete or invoke execution of an unpopulated execution data set with respect to a corresponding case
660
Store the new/modified cases and component models in a storage medium
670
Load cases and component models into memory in an organized form suitable for access by the workflow manager
680

Fig. 11

Case Manager: Main Screen

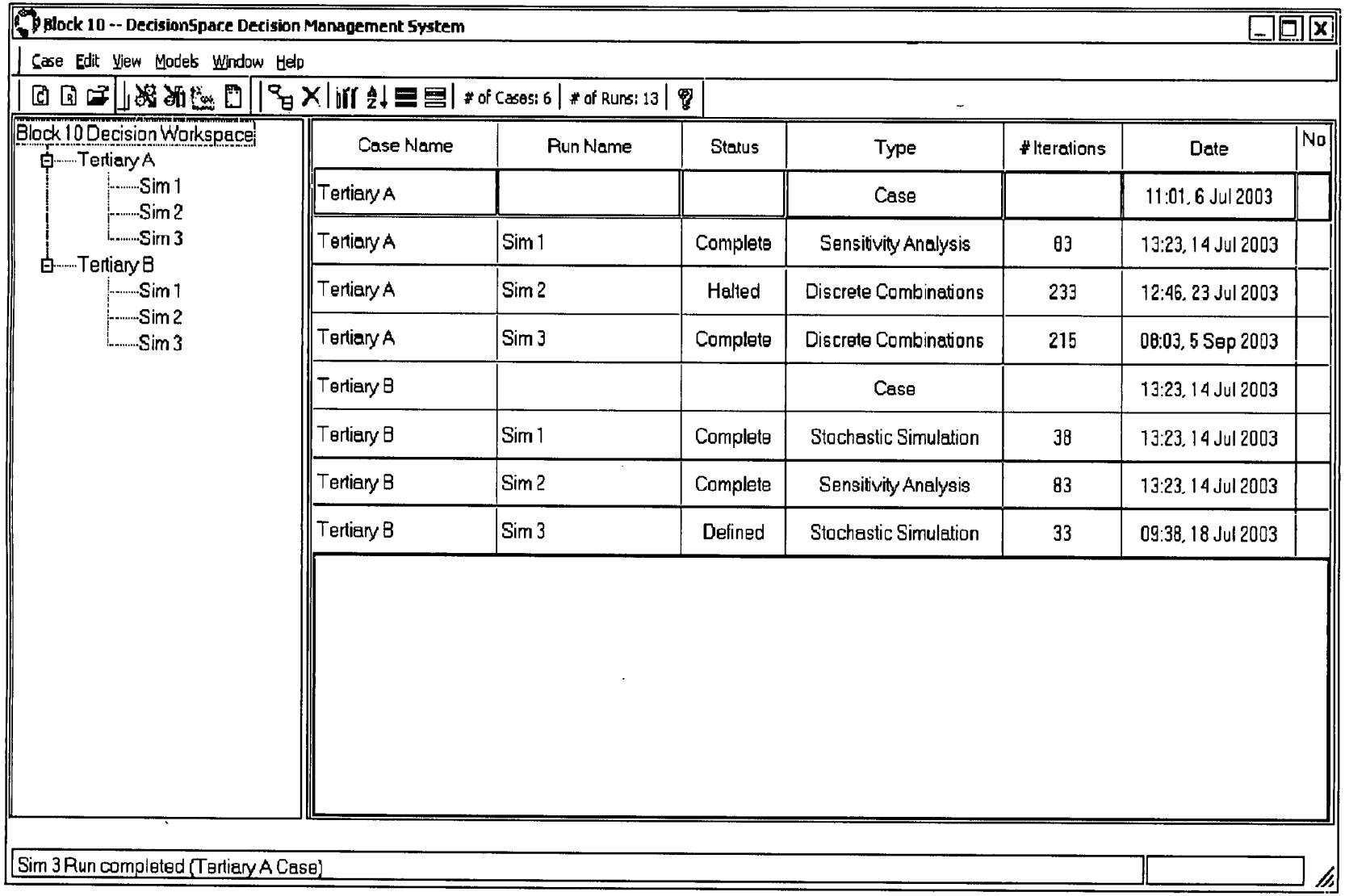

Fig. 12

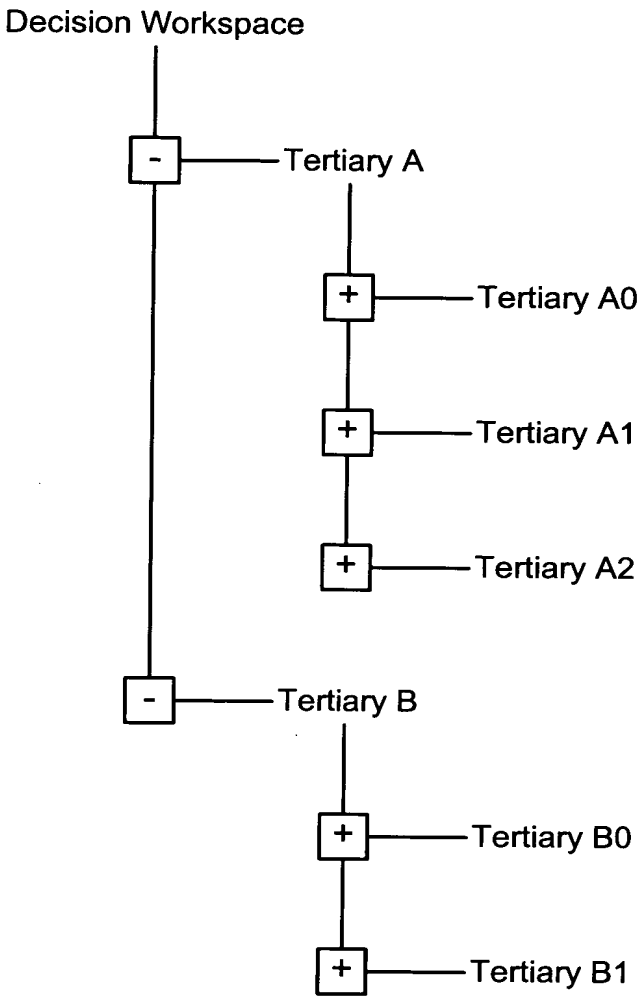
Decision Workspace
-
Tertiary A
+
Tertiary A0
+
Tertiary A1
+
Tertiary A2
-
Tertiary B
+
Tertiary B0
+
Tertiary B1

Fig. 13